

What is claimed is:

1. A system for maintaining fill material solids in position to form a barrier or dam, the system comprising:

(a) a first elongated sheet of geotextile material capable of coiling to form a helical structure;

(b) a means for seaming the first elongated sheet into a first continuous tubular-shaped container having an inside space; and

(c) fill material solids positioned inside the first tubular-shaped container;

(d) wherein the fill material solids are held in position by the first tubular-shaped container to form a barrier or dam.

2. The system of claim 1 wherein the container additionally comprises a second elongated sheet.

3. The system of claim 2 wherein the second elongated sheet is coiled into a second tubular-shaped container within the inside space of the second tubular-shaped container, thereby forming a tubular container having an inner liner.

4. The system of claim 1 in which the first continuous tubular-shaped container is formed by stitching, gluing heat

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bonding or attaching by other means a geotextile material into a tubular shape.

5. The system as set forth in claim 1 whereby said tubular-shaped container comprises opposed ends that are closed to form a barrier or dam.

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6. ~~A system for maintaining fill material solids in position to form a barrier or dam, the system comprising:~~

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(a) a first elongated sheet of geotextile material;

(b) a means for seaming the first elongated sheet into a first continuous tubular-shaped container having an inside space;

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(c) fill material solids positioned inside the first tubular-shaped container, wherein the fill material solids are located within the first tubular-shaped container; and

(d) a first cradle tube positioned adjacent to the first continuous tubular-shaped container, the cradle tube being capable of maintaining the first tubular-shaped container in a stable position to form a barrier or dam.

7. The system of claim 6 in which the cradle tube is positioned substantially parallel to the first tubular-shaped container.



14. The system of claim 13 in which the scour apron is comprised of one or more anchor tubes and a blanket.

15. The system of claim 13 wherein the scour apron is located beneath the first tubular-shaped container.

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16. An apparatus for forming a barrier, comprising:

(a) an elongated container; and

(b) a plurality of independent ballast tubes within the container, the ballast tubes each having an inside and an outside space, the ballast tubes being configured to receive fill material solids on their respective inside spaces, each ballast tube being enclosed such that there is no substantial communication or flow between independent ballast tubes, each ballast tube being capable of maintaining an independent solid fill level and pressure.

17. The apparatus of claim 16, further wherein the elongated container is substantially impermeable.

18. The apparatus of claim 16, further wherein the elongated container is made impermeable by: (i) coating a geotextile fabric which is employed as an elongated container, or (ii) by employing an impermeable geotextile fabric as an elongated container.

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19. ~~The apparatus of claim 16 in which a scour apron is employed in the form of an anchor tube.~~

20. The apparatus of claim 19 in which the scour apron further comprises a blanket.

21. The apparatus of claim 19 wherein the scour apron supports the container on the underside of the container.

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22. A method of forming a barrier or dam using solid materials, comprising:

5 (a) providing an elongated container; and  
(b) providing a plurality of independent ballast tubes within the container, each ballast tube being enclosed such that there is no substantial communication or flow between independent ballast tubes; and

(c) pumping a water/solids slurry into the elongated container.

23. A method of forming a barrier or dam using solid materials, comprising:

5 (a) providing an elongated container; and  
(b) providing a plurality of independent ballast tubes within the container, each ballast tube being enclosed such that there is no substantial communication or flow between independent ballast tubes; and

(c) pumping a water/solids slurry into the ballast tubes.

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24. The method of claim 23 in which the ~~pumping step~~  
(c) further comprises:  
i) pumping water, followed by  
ii) ~~pumping a water/solids slurry into a ballast tube.~~

25. A structure that resists soil or sand erosion against high energy waves, comprising:

(a) an elongated container; and

(b) a plurality of independent ballast tubes within the container, the ballast tubes each having an inside and an outside space, the inside space having a lower portion and an upper portion, the ballast tubes being configured to receive fill material solids on their respective inside spaces;

(c) wherein at least one ballast tube contains solid fill material in a lower portion of the ballast tube and a liquid in the upper portion of the ballast tube, the upper portion of the ballast tube being capable of absorbing wave energy to maintain the structure in a stationary position.

26. The apparatus of claim 25 further comprising a first cradle tube positioned adjacent to the container.

27. The apparatus of claim 25, further comprising a scour apron.

28. The apparatus of claim 25 in which the scour apron further comprises an anchor tube.

29. The apparatus of claim 25 in which the scour apron further comprises a blanket.

30. The apparatus of claim 25 wherein the scour apron supports the container on the underside of the container.

31. A system for maintaining fill material solids in position to form a barrier or dam a water environment, the system comprising:

(a) a first elongated tube having an interior and exterior, the tube being made of substantially impermeable geotextile material; and

(b) a plurality of ballast tubes located within the first elongated tube, the ballast tubes being generally semi-permeable;

(c) wherein fill material solids are held in position within ballast tubes, and water is capable of moving into or out of ballast tubes, the overall barrier or dam being essentially watertight on its exterior surface due to impermeability of the geotextile material, thus resulting in

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~~minimal net water flow to the exterior of the first elongated tube.~~

32. The system of claim 31 wherein the first elongated tube of geotextile material is made impermeable by coating on the exterior surface of said first elongated tube to render the geotextile material less permeable.

33. The system of claim 31 wherein the first elongated tube of geotextile material is comprised of base fibers selected from the group of fibers consisting of: polyester, polypropylene, and synthetic fibers.

34. The system of claim 33 wherein the coating is compatible with the base polymeric fibers, and is selected from the group of coatings consisting of: polyvinyl chloride, polyethylene, and polypropylene.

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~~35. A system for maintaining fill material solids in position to form a barrier or dam in a water environment, the system comprising:~~

5 (a) a first elongated tube having an interior and exterior, the tube being made of partially permeable geotextile material having an inner liner of substantially waterproof fabric; and



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(b) a plurality of ballast tubes located within the first elongated tube, the ballast tubes being generally semi-permeable;

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(c) wherein fill material solids are held in position within ballast tubes, and water is capable of moving into or out of ballast tubes, the overall barrier or dam being essentially watertight on its exterior surface due to impermeability of the liner material, thus resulting in minimal net water flow to the exterior of the first

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elongated tube.

36. An apparatus for forming a barrier, comprising:

(a) an elongated container having two ends; and

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(b) a plurality of independent ballast tubes extending longitudinally within the container, the ballast tubes each having an inside and an outside space, the ballast tubes being configured to receive fill material solids on their respective inside spaces;

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(c) wherein at least one ballast tube is longer than the elongated container.

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~~37. The container of claim 36 further wherein the container is secured along its length by hoops.~~

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38. The container of claim 37 wherein the hoops are comprised of a plurality of thicknesses of geotextile fabric.

39. The container of claim 36 in which a spiral hoop or belt is provided along the length of the container.

40. The container of claim 36 in which the belt provides enhanced resistance to elongation of the container under stress.

41. The container of claim 36 in which the belt is on the outside of the container.

42. An tubular apparatus for forming a barrier, comprising:

(a) an elongated fabric container having two ends;

(b) a plurality of independent ballast tubes extending longitudinally within the container, the ballast tubes each having an inside and an outside space, the ballast tubes being configured to receive fill material solids on their respective inside spaces; and

(c) a plurality of longitudinally spaced reinforced regions along the length of the elongated container, the reinforced regions being supportive of the elongated

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~~container and providing a greater resistance to stress than  
the fabric of the container.~~

43. The apparatus of claim 42 additionally comprising:

(d) a longitudinal belt, the belt being secured to the longitudinally spaced reinforced regions, thereby providing additional stability to the barrier.

~~44. A tubular apparatus for forming a barrier,~~

comprising:

an elongated fabric having two ends, the fabric being helically shaped and joined at a spiral seam by draping the fabric over a cylindrical drum and securing the spiral seam, thereby forming a tubular elongated container.

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